



LOGISTICS OVER THE SHORE

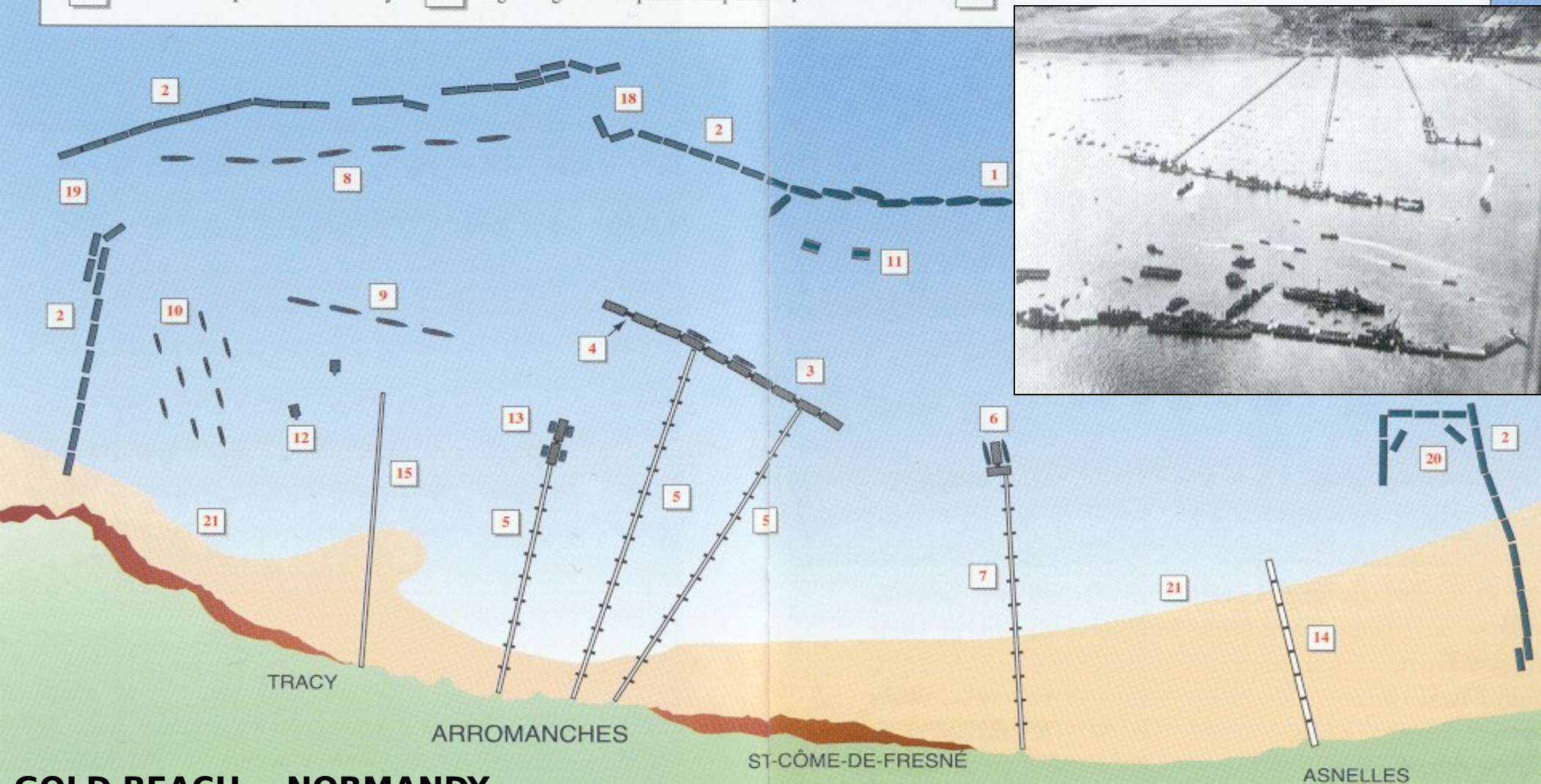
**MST
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LtCol Adrian W. Burke

MAP OF THE MULBERRY HARBOUR AT ARROMANCHES

- | | | |
|--------------------------------------|---|---|
| 1 Sunken blockships | 8 Coastal protection vessel moorings | 15 Floating, fabric, roadway known as a 'Swiss Roll' |
| 2 'Phoenix' caissons | 9 Liberty Ship moorings | 16 Small landing craft moorings |
| 3 Floating quays | 10 Harbour craft moorings | 17 Eastern entrance |
| 4 Intermediate quay | 11 Floating docks | 18 Northern entrance |
| 5 Pontoon roadways | 12 Floating cranes | 19 Western entrance |
| 6 LST quays | 13 Munitions quay | 20 Service vessels sheltered basin |
| 7 Reinforced pontoon roadways | 14 Lightweight transshipment ramp made up of 'Rhino' ferries | 21 Low tide line |



GOLD BEACH - NORMANDY
COAST



PURPOSE

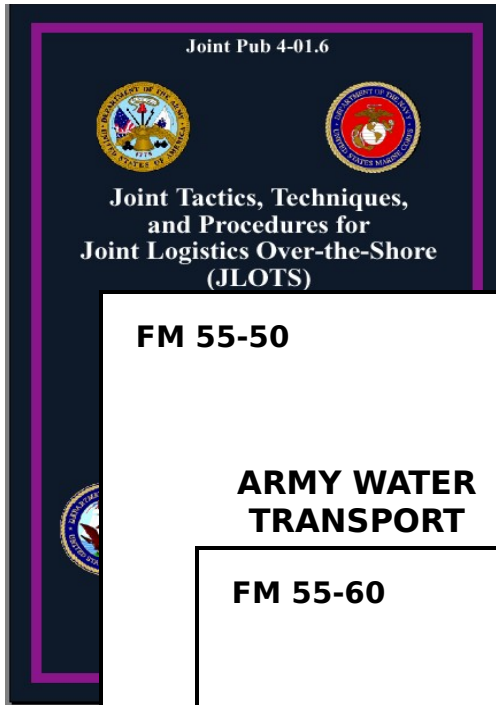
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- **Provide an overview of LOTS operations**
- **Discuss planning considerations**
- **Discuss LOTS operational limitations**



REFERENCES

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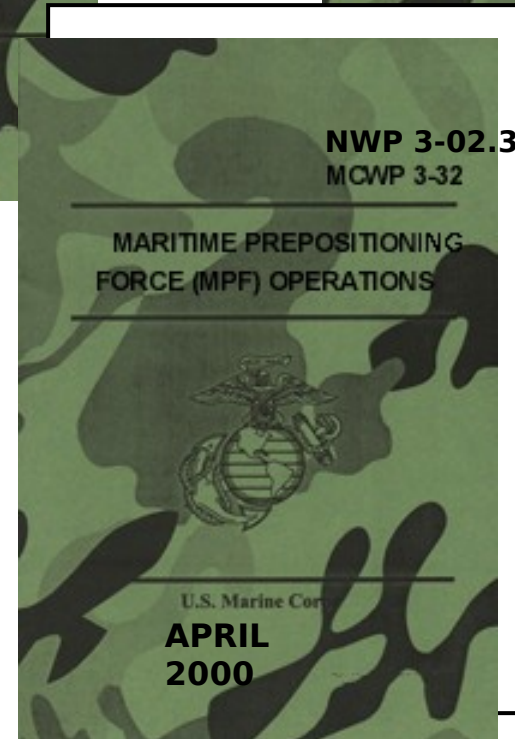
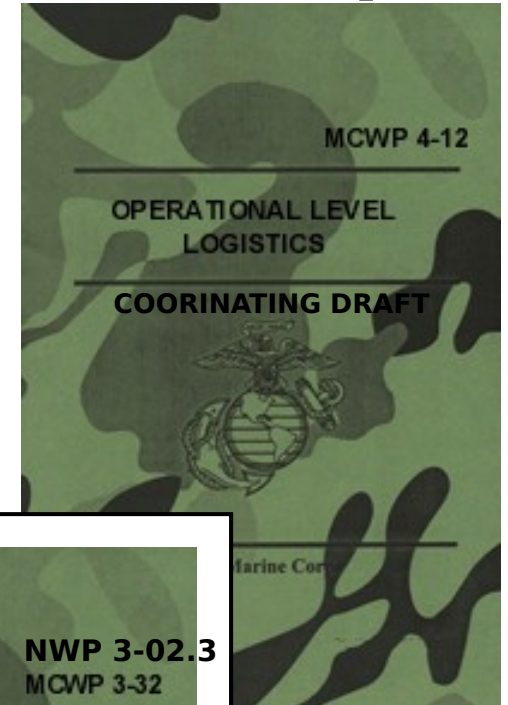
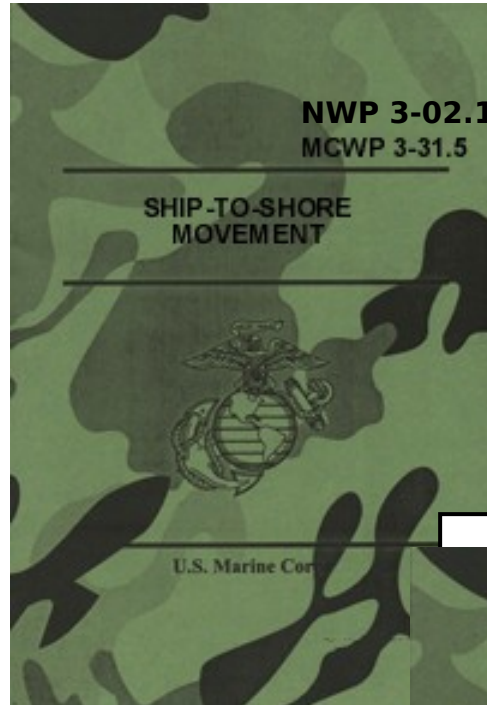
FM 55-50

**ARMY WATER
TRANSPORT**

FM 55-60

**ARMY TERMINAL
OPERATIONS**

**15 APRIL
96**





LOGISTICS OVER THE SHORE

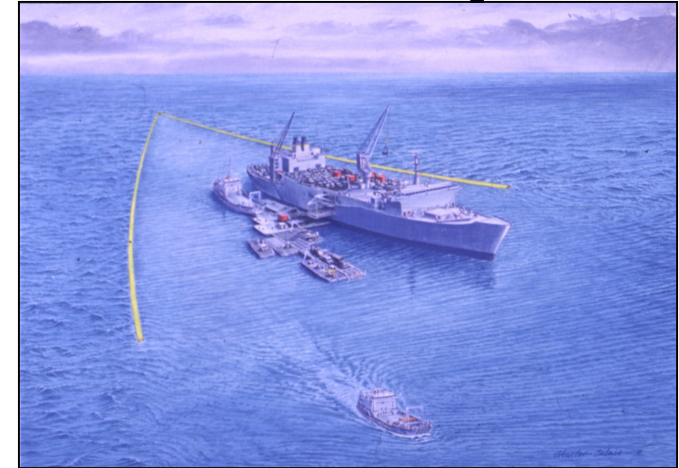
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- **LOTS is the process of **discharging (dry and liquid) cargo** from vessels anchored offshore or in-stream, **transporting** it to shore and/or pier, and **marshalling** it for movement inland**
- **LOTS operations range in scope from bare beach operations to operations supplementing fixed-port facilities and intra-theater movements ... and depend on geographical, tactical, and time considerations**

LOGISTICS OVER THE SHORE



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**Sealift
Ships**

**LOTS is a multifaceted
operation**

**Shipboard
Cranes**

**Ramps &
Interfaces**

Lighters

**Sea State
Mitigation**



LOGISTICS OVER THE SHORE

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- **LOTS environment**
 - **Operations conducted**
 - **Over unimproved (bare beach) shorelines**
 - **Through fixed ports not accessible to deep draft shipping**
 - **Through fixed ports damaged or inadequate without the use of LOTS**
- **JLOTS operations**
 - **LOTS operations conducted jointly by the Army and Navy under a JFC**
 - **Navy LOTS includes the use of Marine Corps forces**
- **Conducted within a LOA (LOTS Operation Area)**



LOGISTICS OVER THE SHORE

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- **Both Army and Navy conduct LOTS**
- **Amphibious operations:**
 - **Navy may conduct LOTS operations in conjunction with the Marine Corps**
 - **Responsible for the discharge of cargo to the high water mark**
 - **Landing force responsible for the acceptance, transfer, and transport to inland marshalling areas**



LOGISTICS OVER THE SHORE

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- **Both Army and Navy conduct LOTS**
- **Post amphibious operation or as stand alone operations:**
 - **Army LOTS operations are generally conducted as part of base, garrison, or theater development**
 - **Supplies and equipment are moved ashore and made available for onward movement to the organization responsible for theater movement control**



NAVY ROLE

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The Navy has primary responsibility for providing forces and equipment for conducting strategic sealift download of maritime prepositioning forces and assault follow-on echelon (AFOE) vessels ... conducting strategic sealift off-load operations of sustainment supplies ... executing offshore petroleum discharge system (OPDS) operations, and supporting JLOTS operations



ARMY ROLE

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The Army is responsible for providing forces and equipment for conducting strategic sealift download of Army prepositioning ships carrying Army war reserve stocks ... conducting strategic sealift off-load operations of sustainment supplies ... supporting JLOTS operations and waterway main supply route requirements



MARINE ROLE

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- **Provide MHE and motor transport personnel and equipment to receive and transport cargo from the Beach Support Area**
- **Provide potable water and its storage facilities**
- **Prepare unimproved beach surfaces and backwater surfaces to enhance movement of materials and equipment to marshalling areas**
- **Prepare marshalling areas for containerized and breakbulk cargo and rolling stock**
- **Emplace tactical fuel storage and distribution systems to support bulk fuel operations within**

the Amphibious Objective Area

JP 4-01.6



COAST GUARD ROLE

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Coast Guard teams will assist the LOTS commander by providing elements trained in port and harbor safety and security to ensure the security of vessels, port facilities, cargo, and the safety of cargo operations.

- Port Security Units**
- Port Safety Teams**
- Security Boarding Teams**
- High endurance cutters**
- Patrol boats**

SECURITY MEASURES



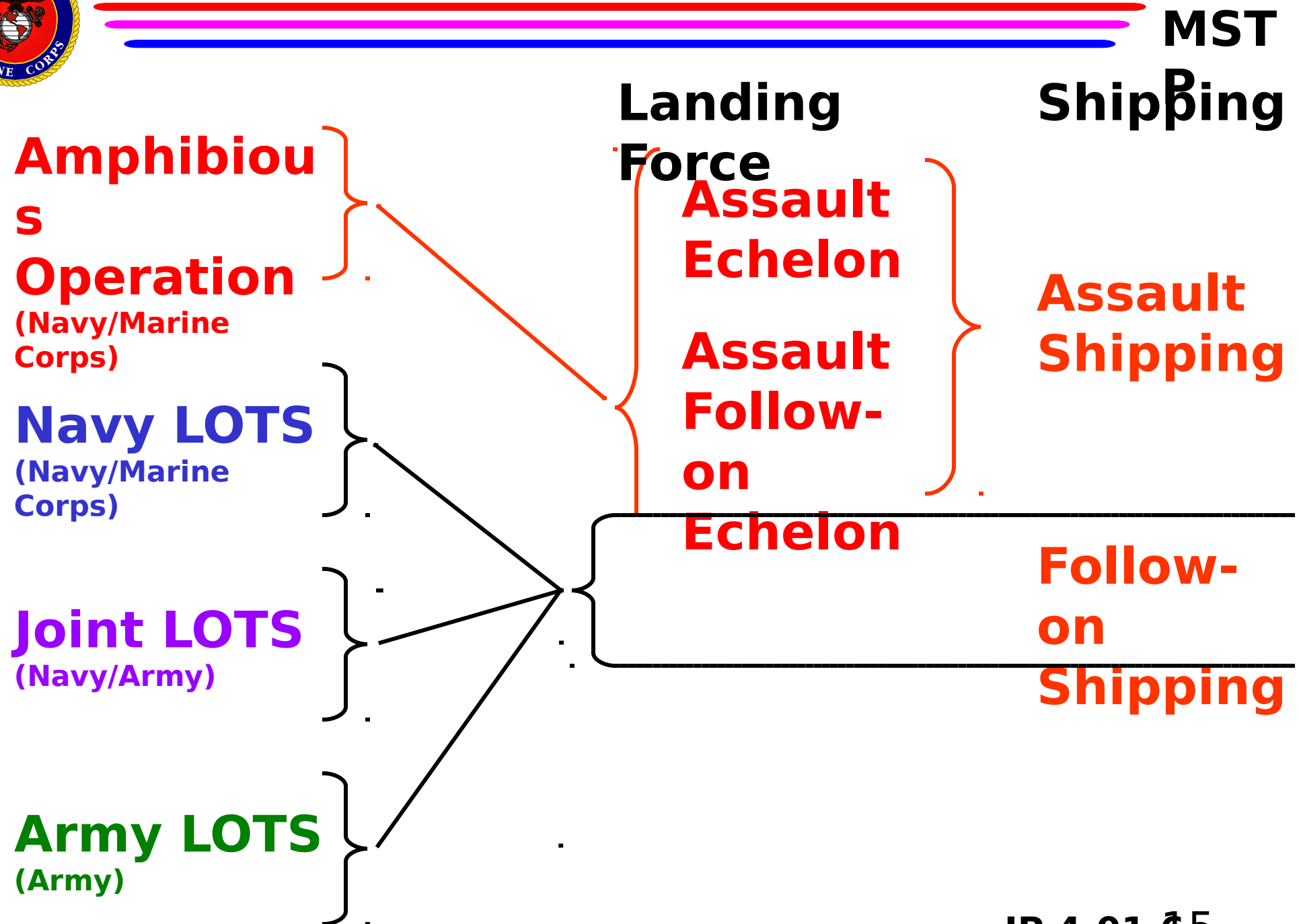
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- **(J)LOTS normally conducted in a low threat environment (friendly or undefended)**
 - **Out of enemy artillery range**
 - **Primary threat: air, rocket, unconventional forces**
- **Offshore Security (active and passive)**
 - **Surface patrol and interdiction operations**
 - **Anti-swimmer operations**
 - **Navy MIUWUs (IDZ/ODZ)**
 - **USCG Port Security Units**
- **Beach Security**
 - **Threat dependent force protection measures**



TRANSITION





LOTS PLANNING

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- **Five **Throughput** events**
 - **Ship cargo transfer (ship-to-lighter)**
 - **Cargo movement from ship-to-shore (lighter transfer time)**
 - **Beach cargo transfer (lighter-to-shore)**
 - **Cargo movement (transit times) to marshalling yards**
 - **Cargo clearance from bare beach or port complex**

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LOTS PLANNING

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- **Throughput capacity depends on:**
 - **Number of suitable anchorages and maneuvering space available**
 - based on evaluation of weather, water depth, underwater obstacles, and surf conditions
 - **Beach capacity**
 - expressed in gallons, barrels, STs, SqFt, or # of containers
 - **Beach throughput**
 - depends on off-load and beach clearance rates
 - **Clearance capacity**
 - estimate of cargo that may be transported inland from beach or port via available inland communications (roads, rail, waterways, pipeline, and air)



THROUGHPUT PLANNING

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- **Analysis considerations:**
 - **Reception capabilities**
 - **Host Nation Support**
 - **Topography, Weather, Hydrography**
 - **Number of ships to be off-loaded**
 - **Number of crane ships available**
 - **Number and types of lighters available**
 - **Length and depth of beach and egress routes**
 - **Distance to marshalling yards**
 - **Access to rail and road networks**



(I) LOTS OPERATIONAL CONSIDERATIONS

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- **Sequence of work**
- **General operational considerations (p III-5)**
- **Specific considerations**
 - **Communications planning**
 - **Ship Discharge Plan**
 - **Lighterage Repair and Supply Support Plan**
 - **Safe Haven Plan**
 - **Lighterage Availability and Utilization Plans**
 - **Weather Support Plan**
 - **Retrograde Cargo operations**
 - **Security planning**
 - **Offshore Anchorage and Mooring Plan**
 - **Port Operations organization planning**

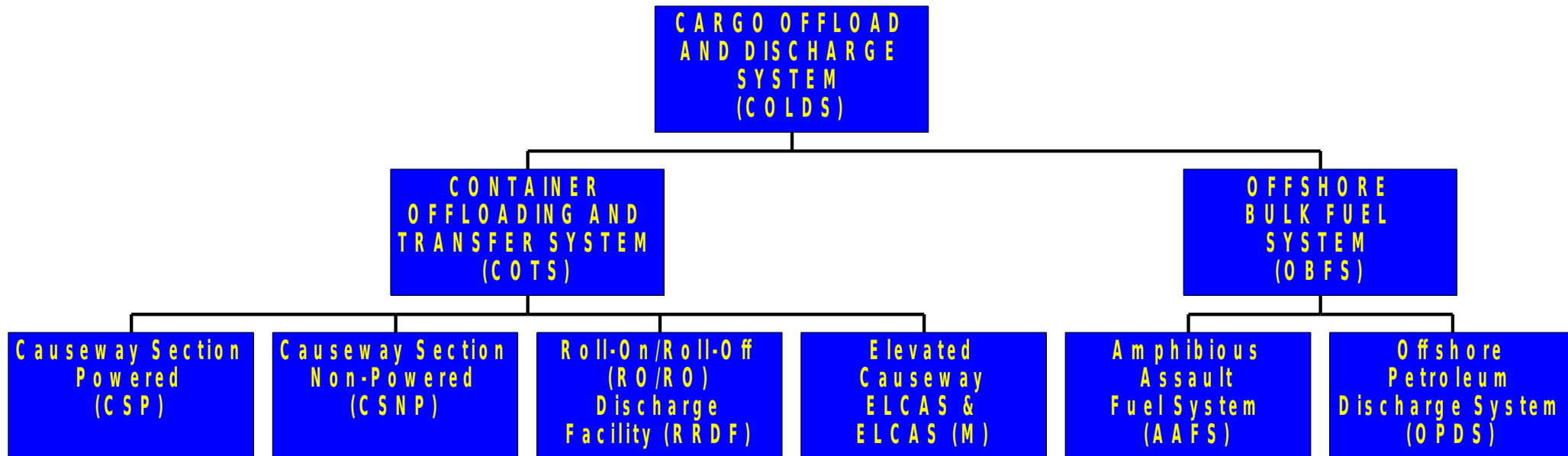
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NAVY LOTS EQUIPMENT

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CARGO OFFLOAD AND DISCHARGE SYSTEM





ARMY LOTS EQUIPMENT

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- **Lighterage**
- **RRDFs**
- **Causeway systems**
- **Terminal service unit MHE**
- **Tactical Water Distribution System (shore-based water storage and distribution system)**
- **Inland Petroleum Distribution System**
 - **Tactical Petroleum Terminal (TPT)**
 - **Mainline Pumping Station**
 - **Pipeline**



BEACH PREPARATION

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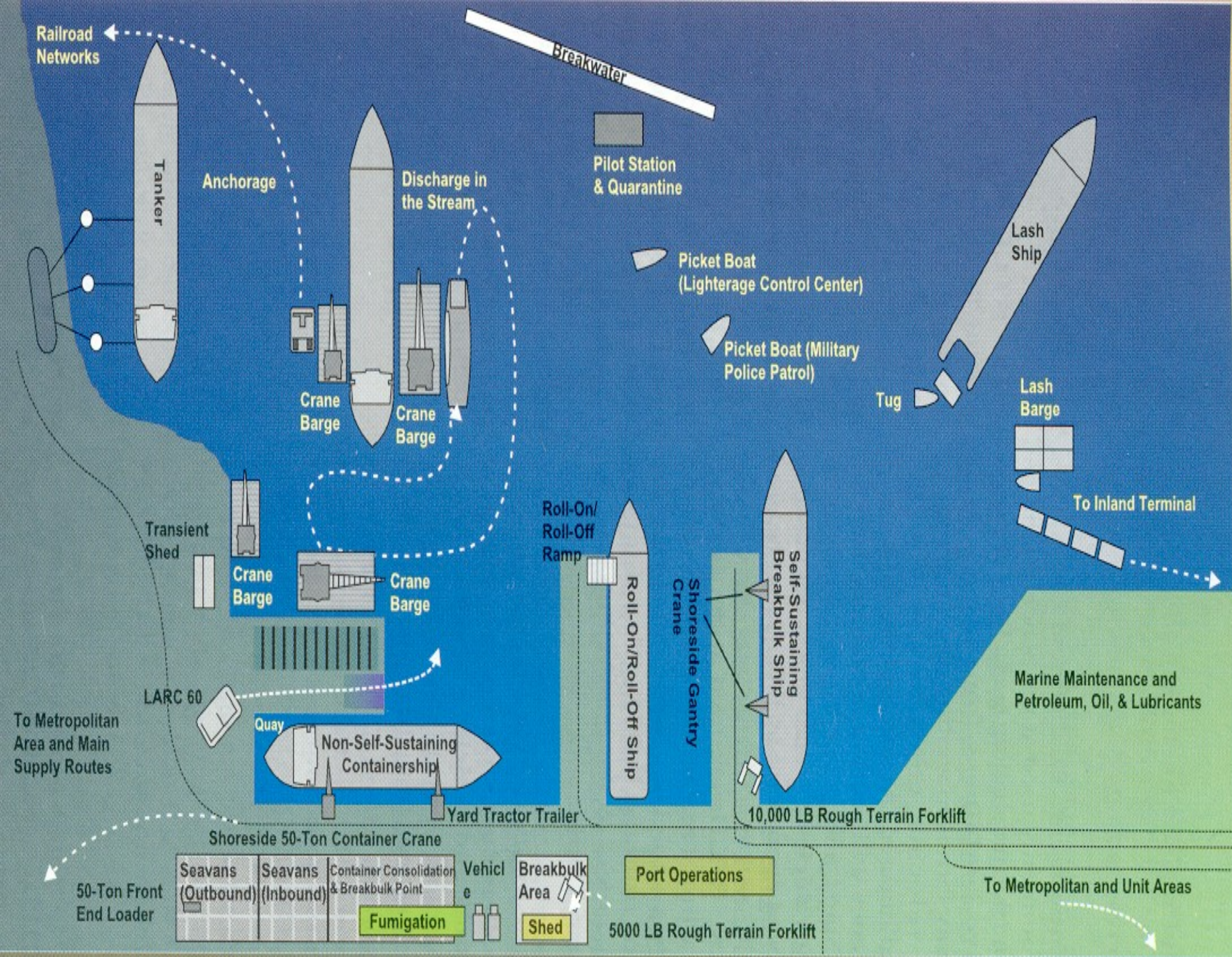
- **Beach reconnaissance**
- **Hydrographic survey**
- **Preparation of lighterage discharge sites**
- **Amphibian water entry and exit points**
- **Beach roadways and Beach exits**
- **Bulk fuel and/or water hoses (onshore preparations)**
- **Beach interfaces for temporary causeways and piers**
- **Ammunition storage**
- **Heliports**



MARSHALLING AREA PREPARATION

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- **Container marshalling area**
- **In-transit storage area preparation**
- **Bulk fuel or water tank farm**
- **Ammunition sites**





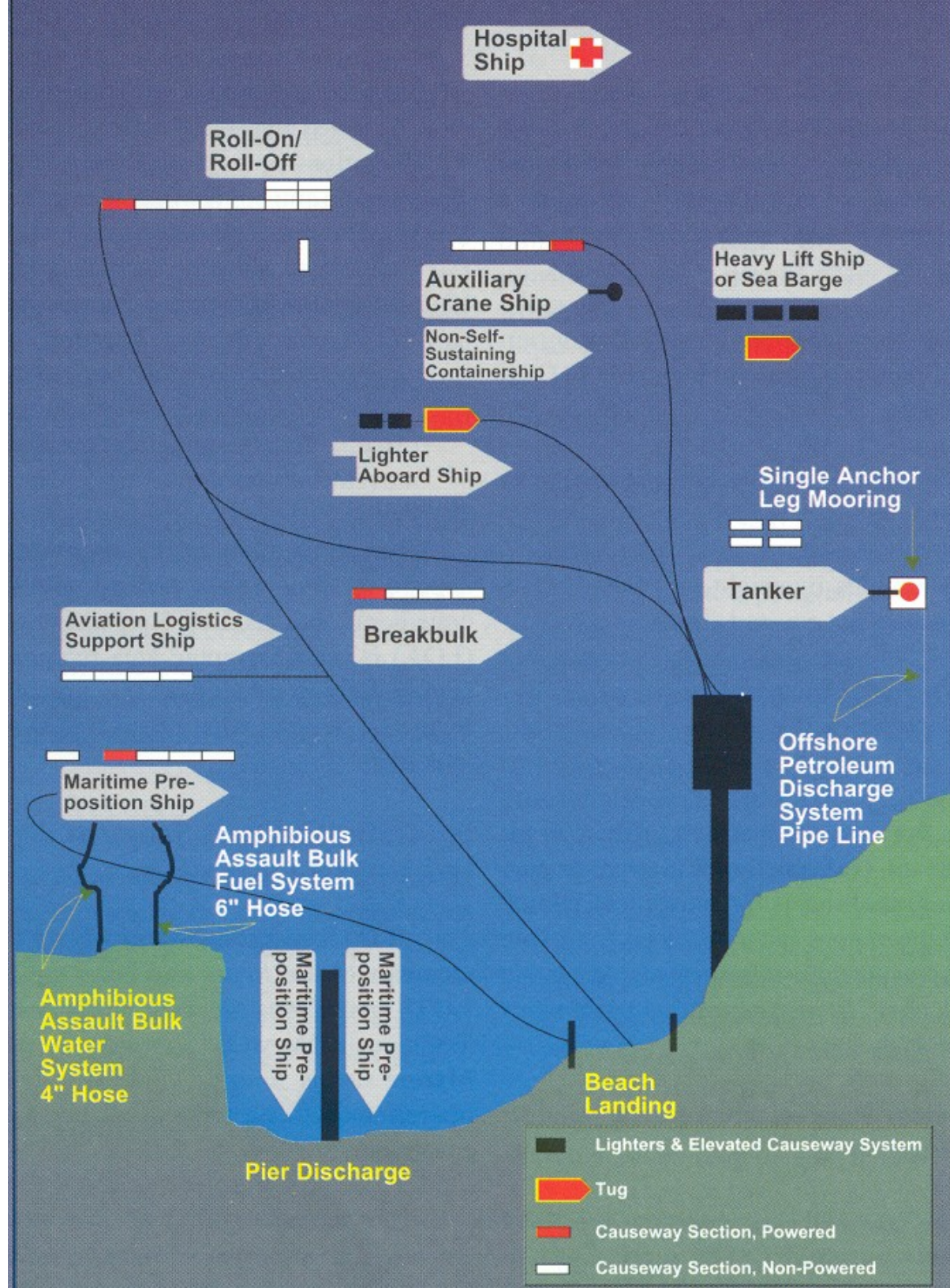
ASSIGNING ANCHORAGES

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Ships are normally assigned anchorages that facilitate cargo throughput.

- **Ship characteristics**
- **Oceanographic and topographic conditions**
- **Cargo type**
- **Lighterage mix and routing scheme**
- **Security considerations**

LOGISTICS OVER THE SHORE (LOTS) OPERATION AREA (LOA)





LOTS PLANNING

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The **ability to clear cargo from a beach** depends upon the **physical features of the beach, weather, oceanographic features, the tactical situation, and the organization and equipment of the unit assigned the throughput operation.**

JP 4-01.6

“Picture puzzles are child’s play compared with this game of working an unheard-of number of craft to

and fro, in and out, of little bits of

beaches.”



LIMITATIONS

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- **LOTS operations and equipment are weather, environmental, and sea state-sensitive**
- **Wind, sea states, ground swell, current, tidal conditions, and near-shore hydrographic conditions can adversely impact ship discharge rates and cargo arrival at the shore side discharge points**

SEA STATE CONDITIONS



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Sea State 0:

Wave Height: 0.1 - 0.15 ft

Wind Speed: 2.5 - 2.8 kts

Sea State 1:

Wave Height: 0.5 - 1.2 ft

Wind Speed: 5.1 - 8.0 kts



Sea State 2:

Wave Height: 1.5 - 3.0 ft

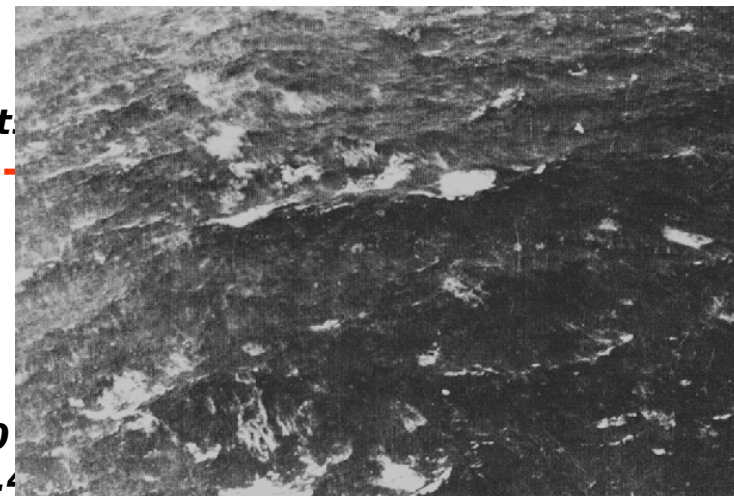
Wind Speed: 5.0 - 12.7 kt.

--LIMIT OF CAPABILITY--

Sea State 3:

Wave Height: 3.5 - 5.0

Wind Speed: 13.7 - 16.4





A WAR STOPPER

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- Ship offload operations were curtailed ^P in Operation Provide Comfort (Somalia 1992) and Exercise Tandem Thrust (Australia 1997) due to an inability to operate in sea states higher than Sea State 2 ...
- ... Sea State 3 has worldwide impact



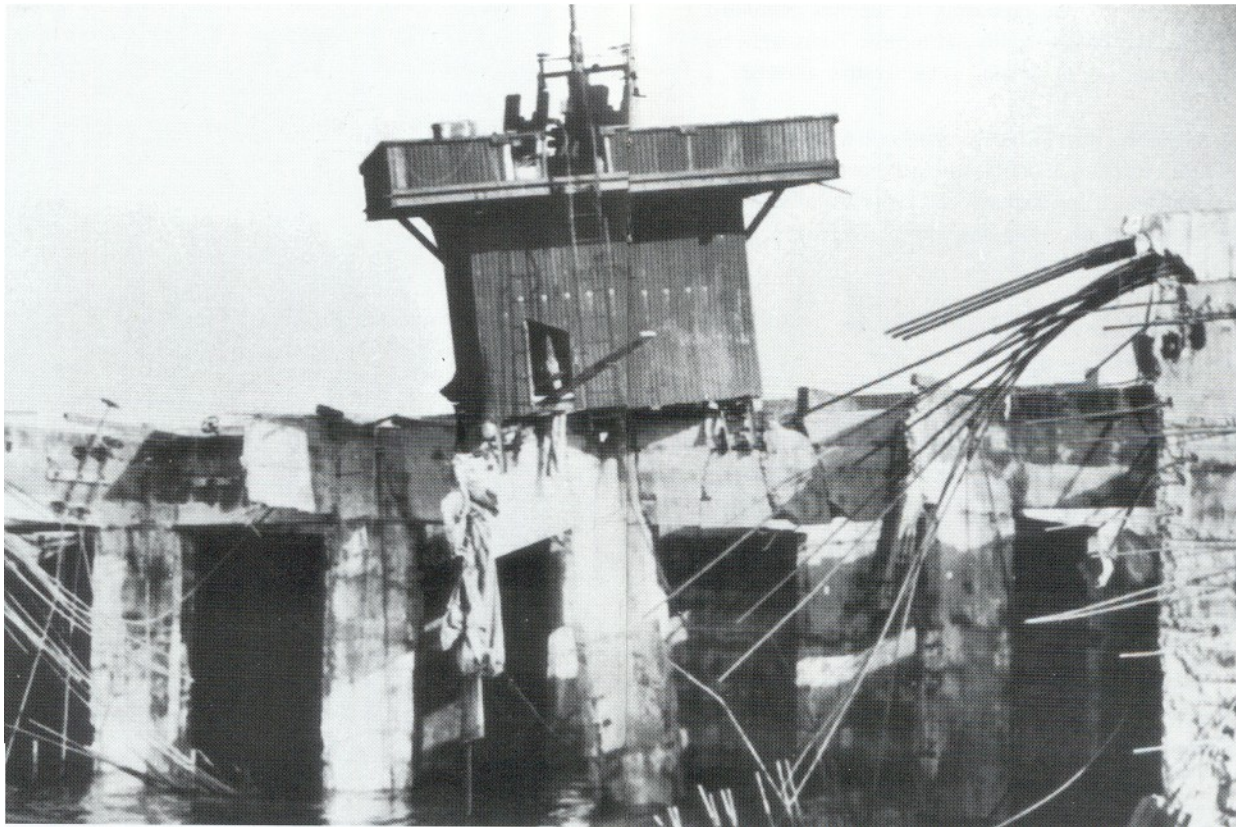
**In some CINC Areas of Responsibility
Sea State 3 exists up to 50% of the time**



SEA STATE EFFECTS

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Arromanches 19 June 44





SEA STATE EFFECTS

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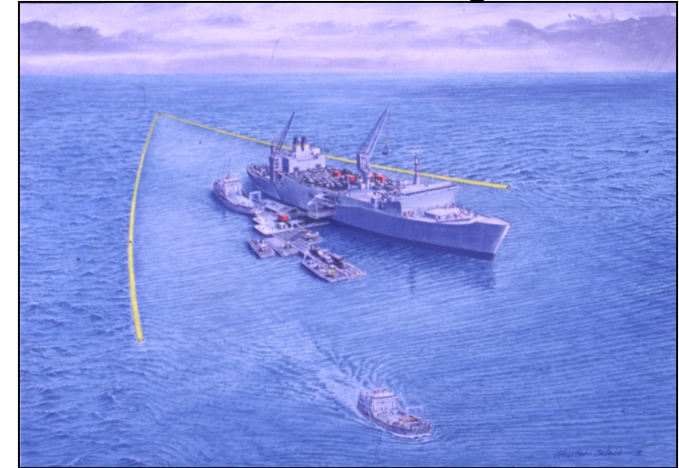
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SUMMARY

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- **Provided an overview of LOTS operations**
- **Discussed planning considerations** ³⁴



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BACK UP INFO FOLLOWS

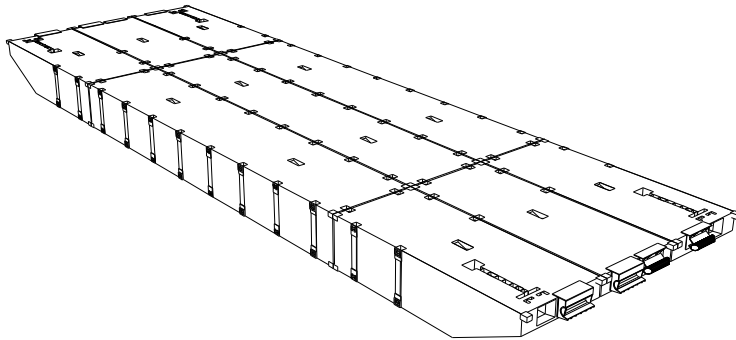


LOTS Equipment

Causeway Sections

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U. S. Army Modular Causeway Section (MCS)

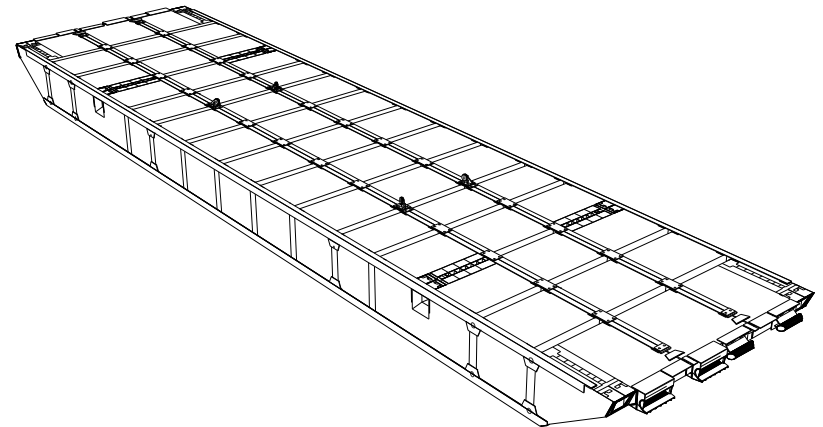


In use: 1990 to present

Size: 24- x 80- x 4.5-ft

Significant Feature: Intermodal
Transport

U. S. Navy Lightered (NL) Causeway Section



In use: **World War II**

Size: **21- x 90- x 5-
ft**

Significant Feature:

36

Proven System



Causeway (Barge) Ferry

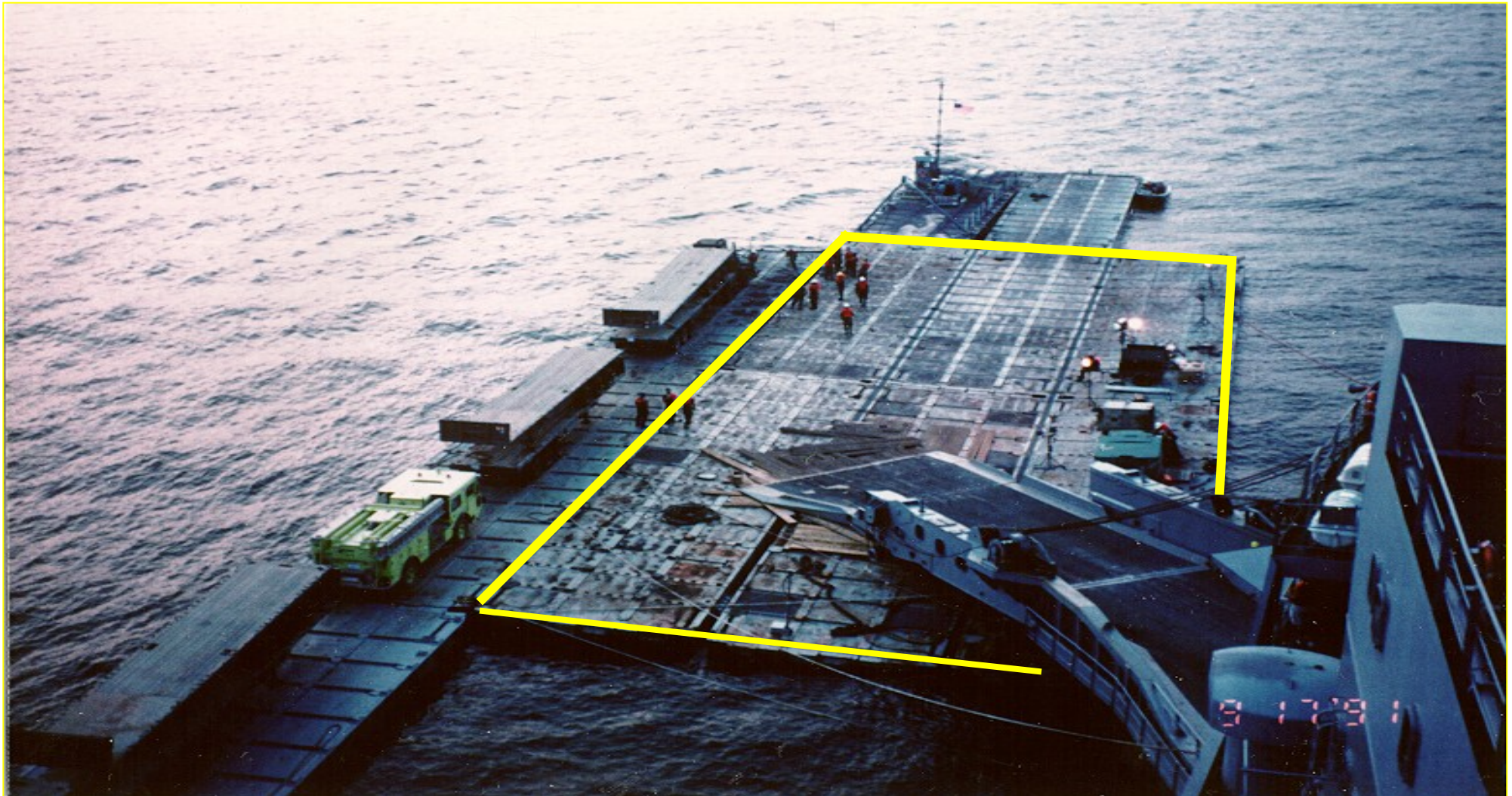
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Roll-on/Roll-off Discharge Facility

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RRDF Sideport Discharge



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RRDF Stern Discharge



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Elevated Causeway (Modular)

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ELCAS(M) Installation

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Crane Ship

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Sea Barge Ship

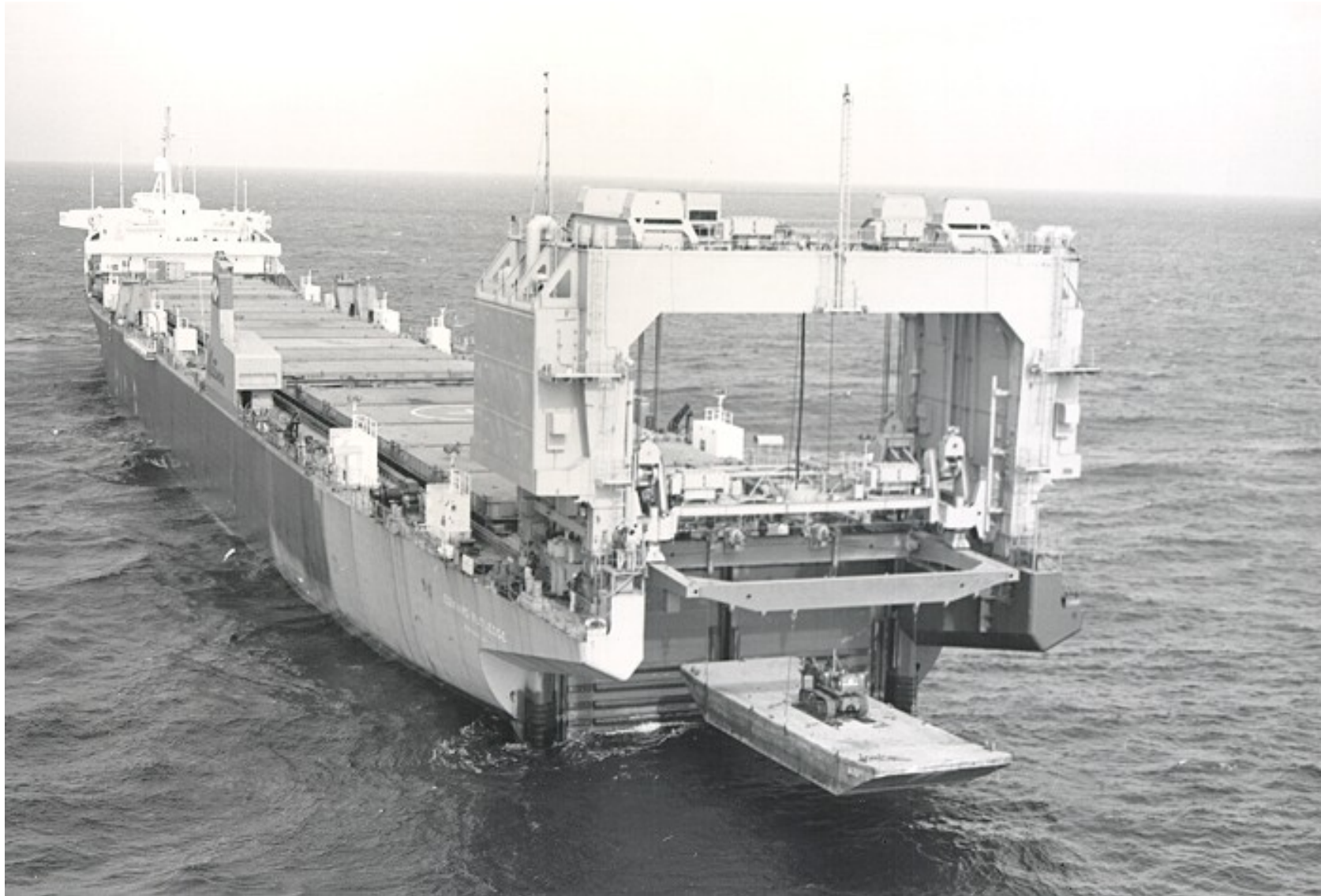
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LASH Ship

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Offshore Petroleum Discharge System

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OPDS SALM Launch

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CINC Requirements

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- Sustain operations in sea state 3
- Service interoperability



Solutions

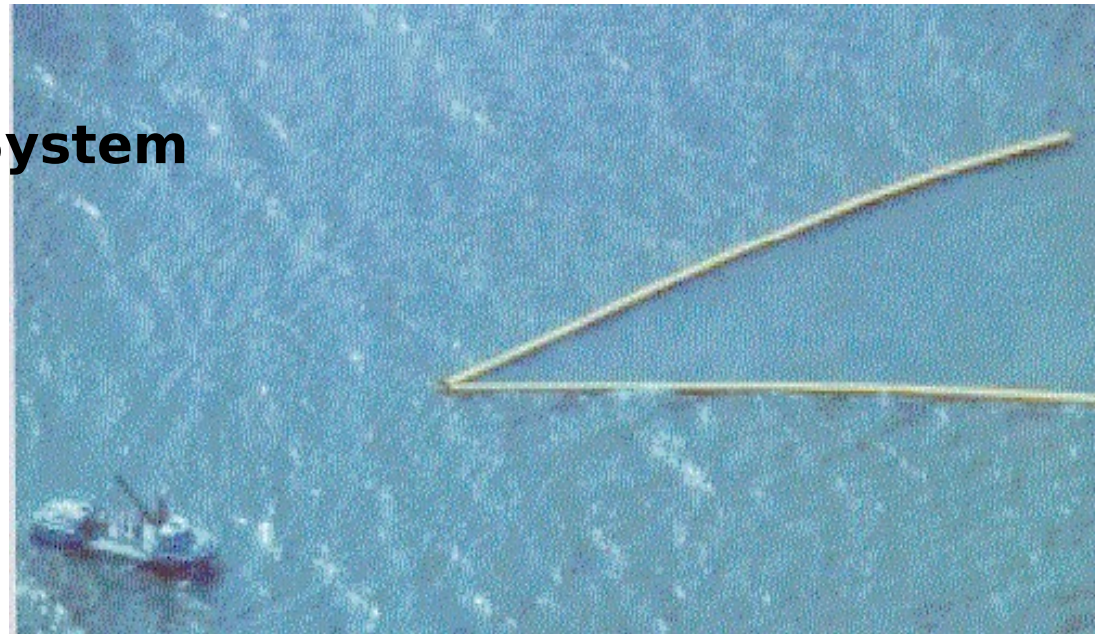


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20' module of 1:3 Scale RIB System

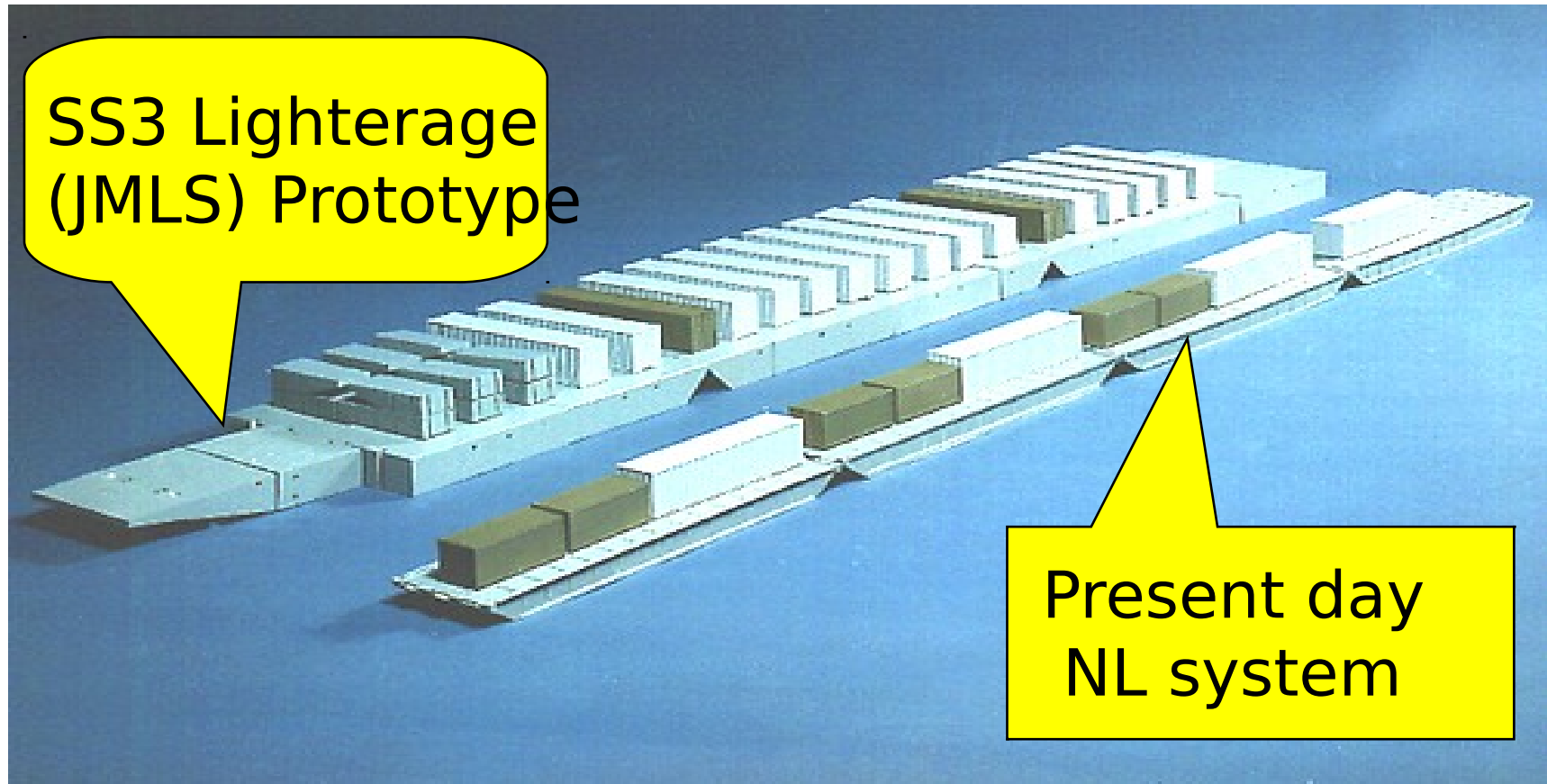
**Waterways
Experiment Station
lead on development
of RIB**





JOINT MODULAR CAUSEWAY SYSTEM

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SS3 Lighterage Prototype Demonstration in
FY99

